

CLAIMS

1. A DNA synthesis reaction-enhancer comprising at least one kind selected from the group consisting of acidic substances and cationic complexes.

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2. The DNA synthesis reaction-enhancer according to claim 1, wherein said acidic substance is an acidic macromolecular substance.

3. The DNA synthesis reaction-enhancer according to claim 2, wherein said acidic macromolecular substance is an acidic polysaccharide.

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4. The DNA synthesis reaction-enhancer according to claim 2 or 3, wherein said acidic macromolecular substance is one or more substances selected from the group consisting of sulfated-fucose-containing polysaccharides, dextran sulfate, carrageenan, heparin, rhamnam sulfate, dermatan sulfate (chondroitin sulfate B), heparan sulfate, hyaluronic acid, alginic acid, pectin, polyglutamic acids, polyacrylic acids, polyvinyl sulfates, polystyrene sulfates, carrageenan, DNA and salts thereof.

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5. The DNA synthesis reaction-enhancer according to claim 4, wherein said sulfated-fucose-containing polysaccharide is sulfated-fucose-containing polysaccharide-F or sulfated-fucose-containing polysaccharide-U.

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6. The DNA synthesis reaction-enhancer according to claim 1, wherein said cationic complex is a transition metal complex.

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7. The DNA synthesis reaction-enhancer according to claim 6, wherein a central atom in said transition metal complex is a transition element of the Group VIII of the elemental periodic table.

8. The DNA synthesis reaction-enhancer according to claim 7, wherein said transition element is one or more elements selected from the group consisting of cobalt, rhodium and iridium.

9. The DNA synthesis reaction-enhancer according to claim 8, wherein said transition metal complex is one or more kinds selected from the group consisting of $[\text{Co}(\text{NH}_3)_6]\text{Cl}_3$, $[\text{Co}(\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2)_3]\text{Cl}_3$ and $[\text{Rh}(\text{H}_2\text{NCH}_2\text{CH}_2\text{NH}_2)_3]\text{Cl}_3$.

10. A DNA synthesis method characterized in that during a DNA synthesis reaction a reaction is carried out in the presence of the DNA synthesis reaction-enhancer of any one of claims 1 to 9 by using DNA polymerase.

11. The DNA synthesis method according to claim 10, wherein two or more kinds of DNA polymerases are used.

12. The DNA synthesis method according to claim 11, wherein one DNA polymerase having $3' \rightarrow 5'$ exonuclease activity, and the other DNA polymerase having no $3' \rightarrow 5'$ exonuclease activity are used.

13. The DNA synthesis method according to claim 11, wherein two or more

kinds of DNA polymerases each having 3' → 5' exonuclease activity are used.

14. The DNA synthesis method according to claim 13, wherein α -type DNA polymerase and non- α , non-poll type DNA polymerase are used.

15. The DNA synthesis method according to any one of claims 10 to 14, which is carried out by polymerase chain reaction (PCR) method.

16. A DNA synthesis reaction composition comprising the DNA synthesis reaction-enhancer of any one of claims 1 to 9.

17. The DNA synthesis reaction composition according to claim 16, further comprising DNA polymerase.

18. The DNA synthesis reaction composition according to claim 17, wherein the composition comprises two or more kinds of DNA polymerases.

19. The DNA synthesis reaction composition according to claim 18, wherein the composition comprises two or more kinds of DNA polymerases each having 3' → 5' exonuclease activity.

20. The DNA synthesis reaction composition according to claim 19, wherein the composition comprises α -type DNA polymerase and non- α , non-poll type DNA polymerase.

21. The DNA synthesis reaction composition according to claim 18, wherein the composition comprises one DNA polymerase having $3' \rightarrow 5'$ exonuclease activity, and the other DNA polymerase having no $3' \rightarrow 5'$ exonuclease activity.

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22. A DNA synthesis reaction composition comprising two or more kinds of DNA polymerases each having $3' \rightarrow 5'$ exonuclease activity.

23. The DNA synthesis reaction composition according to claim 22, wherein the composition comprises α -type DNA polymerase and non- α , non-poll type DNA polymerase.

24. A DNA synthesis method characterized in that during a DNA synthesis reaction two or more kinds of DNA polymerases each having $3' \rightarrow 5'$ exonuclease activity are used.

25. The DNA synthesis method according to claim 24, wherein α -type DNA polymerase and non- α , non-poll type DNA polymerase are used.

26. The DNA synthesis method according to claim 24 or 25, which is carried out by polymerase chain reaction (PCR) method.

27. A kit for use in *in vitro* DNA synthesis, comprising two or more kinds of DNA polymerases each having $3' \rightarrow 5'$ exonuclease activity.

28. The kit according to claim 27, wherein the kit comprises α -type DNA

polymerase and non- α , non-poll type DNA polymerase.

29. The kit according to claim 27 or 28, further comprising a reagent usable for DNA synthesis.

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30. The kit according to any one of claims 27 to 29, wherein said DNA polymerase is a thermostable DNA polymerase.

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31. A kit for use in *in vitro* DNA synthesis, wherein the kit comprises the DNA synthesis reaction-enhancer of any one of claims 1 to 9 and DNA polymerase.

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32. The kit according to claim 31, further comprising a reagent usable for DNA synthesis.

33. The kit according to claim 31 or 32, which comprises two or more kinds of DNA polymerases.

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34. The kit according to any one of claims 31 to 33, wherein said DNA polymerase is a thermostable DNA polymerase.

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